

AD-A123 053

GORDON RESEARCH CONFERENCE ON HIGH TEMPERATURE  
CHEMISTRY (1982) TILTON SCHOOL TILTON NEW HAMPSHIRE  
JULY 26-30 1982(U) GORDON RESEARCH CONFERENCES INC

1/1

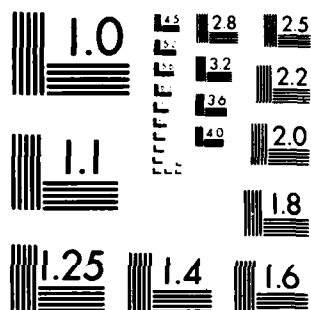
UNCLASSIFIED

AUG 82

F/G 7/4

NL

END
DATE
FILED
DTIC



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A

AD A123053

Final Report to the  
Office of Naval Research  
Department of the Navy  
800 North Quincy Street  
Arlington, Virginia 22217

1982 GORDON RESEARCH CONFERENCE  
ON  
HIGH TEMPERATURE CHEMISTRY

July 26-30, 1982  
Tilton School  
Tilton, New Hampshire

①  
SLC  
JAN 4 1983  
H

Wayne L. Worrell  
Wayne L. Worrell  
Conference Chairman  
University of Pennsylvania  
Philadelphia, Pa. 19104

Karl E. Spear  
Karl E. Spear  
Vice Chairman  
Pennsylvania State University  
University Park, Pa. 16802

Alexander M. Quickshank  
Alexander M. Quickshank  
Director, Gordon Research Conference  
Department of Chemistry  
University of Rhode Island  
Kingston, Rhode Island 02881

CONFERENCE SECRETARY'S  
Approved for public release  
Distribution Unlimited

August, 1982

DTIC FILE COPY

82 11 18 052

Final Report to the  
Office of Naval Research  
1982 Gordon Research Conference on  
High Temperature Chemistry  
July 26-30, 1982  
Tilton School  
Tilton, New Hampshire

Conference Chairman  
Wayne L. Worrell  
Materials Science Department/K1  
University of Pennsylvania  
Philadelphia, Pa. 19104  
(215) 243-3592

Vice Chairman  
Karl E. Spear  
Materials Research Lab.  
Pennsylvania State University  
University Park, PA 16802  
(814) 865-1198

Background and Nature of Conference

The Gordon Research Conference on High Temperature Chemistry has been held biennially since 1960. As such, it is the only regularly scheduled international meeting where the interdisciplinary group comprising high temperature science can interact and discuss forefront issues of the day. Gordon Conference surveys of past participants have indicated this conference to be extremely helpful in the generation of new research ideas and contacts. The mix of foreign, local, academic, industrial and government participants is also a recognized hallmark of such meetings.

The 1982 Conference had 17 invited talks in the areas of:

- Kinetics of Gas Phase Reactions;
- Surface Reactions;
- Chemical Vapor Transport;
- Novel Investigations of Corrosion Reactions
- Thermodynamics of Liquids and Glasses;
- Solid State Electrochemistry;

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	<i>file</i>
By <i>file</i>	
Distribution/	
Availability Codes	
Avail and/or	Special
Dist <i>A</i>	



- ° Nuclear Reactor Accident Modeling and High Temperature Chemistry
- ° Ab Initio Calculations of Molecular Structure and Properties
- ° Spectroscopy of High Temperature Molecules

There were 38 invited poster presentations, which provided an additional forum for in-depth discussions of other active research topics in the field. The conference program and a list of invited poster papers are attachments A and B, respectively.

The conference had a total attendance of 105, including 20 from industrial laboratories, 30 from governmental laboratories, 40 from Universities and 15 from outside the U.S. Attachment C is a list of participants.

In accordance with Gordon Conference policy, no printed abstracts or papers were produced or distributed. The minutes of the conference business meeting, as prepared by the conference secretary, Dr. Clifford Myers, are appended as Attachment D.

#### Finances

A total of \$19,000 was available for disbursement by the conference chairman. Of this amount, the Gordon Research Conference provided \$7,500 (from conference fees), the Morgantown Energy Technology Center (METC) contributed \$15,000, the Office of Naval Research (ONR) - \$3,000, the General Electric Company \$2,000, and IBM - \$7,500. These funds were used to offset the fixed conference fee (\$230) and/or travel expenses of key participants - primarily speakers and discussion leaders. Fifteen young scientists (postdoctoral and graduate students), whose attendance would otherwise not have been possible, were also supported by this fund. A budget summary of the ONR contribution is given in Attachment E.

#### Acknowledgment and Comments

Partial support of this conference by ONR is gratefully acknowledge. The 1982

Conference was pertinent to many of the naval research interests, particularly in the areas of corrosion reactions, solid-state electrichemistry, surface reactions and chemical vapor transport. We are confident that the free exchange of forefront information, so evident at this conference, will be beneficial to exisiting and future ONR supported programs.

## HIGH TEMPERATURE CHEMISTRY

July 26-30, 1982  
Tilton School, Tilton, New Hampshire

Wayne L. Worrell, Chairman, and Karl E. Spear, VC

Monday, July 26

## Kinetics of Gas Phase Reactions

D. L. Hildenbrand, Discussion Leader

"Kinetic Measurements of Free Radical  
and Gaseous Species"

C. E. Kolb  
Aerodyne Research, Inc.

"The Oxidation of Alkaline Earth Metal  
Vapors by  $N_2O$ "

P. J. Dagdigan  
John Hopkins University

## Surface Reactions

G. M. Rosenblatt, Discussion Leader

"Relationships between Surface Structure  
and Catalytic Reactivity"

D. Wayne Goodman  
Sandia National Laboratories

"Chlorine Reactions at Metal-Oxide  
Surfaces"

P. Nordine  
Yale University

"Invited Poster Session on Recent Advances  
in High Temperature Chemistry"

Tuesday, July 27

## Chemical Vapor Transport

P. Gilles, Discussion Leader

"Complex Halide Vapors and their  
Significance in Vapor Transport"

H. Oye  
Norwegian Institute of Technology

"Chemical Vapor Transport and Thermodynamic  
Analysis of Metal-Chalcogenide-Halide  
Systems"

H. Wiedemeier  
Rensselaer Polytechnic Institute

## Novel Investigations of Corrosion Reactions

J. B. Wagner, Jr., Discussion Leader

"Hot Corrosion Reactions of Metals with  
Thin Salt Films"

R. A. Rapp  
Ohio State University

"In-situ Raman Spectroscopic Character-  
ization of Corrosion Reaction Products"

A. S. Nagelberg and J. C. Hamilton  
Sandia National Laboratories

"Invited Poster Session on Recent Advances  
in High Temperature Chemistry"

Wednesday, July 28

## Thermodynamics of Liquids and Glasses

L. Brewer, Discussion Leader

"Thermodynamic Properties of Ordered  
Liquid Mixtures"

M. Blander  
Argonne National Laboratory

High Temperature Chemistry-2, 1932

Wednesday, July 28, continued

'Structural Interpretations of the  
Thermodynamic Properties of Glasses and  
Crystals'

Solid State Electrochemistry

'Transport Properties of Some Transition-  
Metal Oxides'

'High Conductivity Solid Electrolytes'

'Invited Poster Session on Recent  
Advances in High Temperature Chemistry'

A. Navrotsky  
Arizona State University

C. B. Alcock, Discussion Leader

R. Dieckmann  
Universitat Hannover

G. C. Farrington,  
University of Pennsylvania

Thursday, July 29

Ab Initio Calculations of Molecular  
Structure and Properties

'Ab Initio Calculations of the Structure  
and Properties of Transition-Metal Gaseous  
Hydrides'

'Ab Initio Calculations of the Properties  
of Molecules and "Atomic Clusters": Current  
Capabilities and Future Prospects'

Nuclear Reactor Accident Modeling and  
High Temperature Chemistry

Specific Aspects

W. Weltner, Discussion Leader

H. F. Schaefer  
University of California, Berkeley

J. O. Arnold  
NASA-AMES Research Center

Overview D. D. Cubicciotti  
Electric Power Research Institute

D. Olander, University of California  
M. Adamson, General Electric Vallecitos  
R. Sallach, Sandia National Laboratories  
P. Potter, AERE, Harwell

Friday, July 30

Spectroscopy of High Temperature  
Molecules

'Spectroscopy in Supersonic Molecular  
Beams: The Fluorescence of NaI'

'Magnetic Circular Dichroism Spectra of  
Matrix Isolated High Temperature  
Molecules'

J. W. Hastie, Discussion Leader

D. H. Levy  
University of Chicago

M. Vela  
University of Florida



POSTER PAPERS FOR GORDON RESEARCH CONFERENCE ON  
HIGH TEMPERATURE CHEMISTRY  
Tilton School, Tilton, New Hampshire  
July 26-30, 1982

Poster #	Presentation on Monday, on display Monday and Tuesday
1	E. Fitzer and K. Brennfleck, University of Karlsruhe, West Germany "Superconducting Nb(C,N) layers on carbon fibers by chemical vapor deposition and subsequent surface reactions"
3	E.C. Beahm and O.L. Culberson, Oak Ridge National Laboratory "Uncertainty analysis in thermodynamic calculations"
5	M.L. Saboungi, R.M. Yonco, Argonne National Laboratory and O. J. Kleppa, University of Chicago: "Enthalpy of mixing of liquid Rb-Au alloys"
7	R.D. Brittain, D.L. Hildenbrand and K.H. Lau, SRI International: "Thermodynamics of metal sulfate decomposition"
9	J.G. Edwards, R. Haque, S. Kshirsagan, and A. Qusti, University of Toledo: "Discoveries about ternary sulfides through high-temperature vaporization studies"
11	R. Schiffman and P. Nordine, Yale University: "Containerless high temperature investigations by laser induced atomic fluorescence"
13	R. Schoonmaker, Oberlin College: "Scattering of molecular beams from surfaces: dynamics of gas-surface interactions and the mechanism of condensation of cesium atoms and alkali halide molecules of NaCl (100)"
15	D. M. Speros, General Electric Co., Cleveland: "Correlation between kinetic, crystallographic (surface structural) and thermodynamic quantities: Part I: Thermal dissociation of certain solids"
17	R. W. Ohse, J.F. Babelot, J. Magill (European Institute for Transuranium Elements, Karlsruhe, W-Germany), C. Cercignani (Istituto di Matematica del Politecnico di Milano, Italy), A. Frezzotti (DIRES RICE-Alfa Romeo, Milano, Italy), and J.P. Hiernaut, M. Hoch (University of Cincinnati): "High temperature vaporization of uranium oxide - consistency of mass spectrometric and depth measurement with thermodynamic calculations of the vapor pressure over $UO_2$ up to 5000 K"
19	J. Hvistendahl (University of Tennessee), P. Kjaeboe (University of Oslo, Norway) and E. Rytter, H.A. Øye (Norwegian Institute of Technology, Trondheim, Norway): "Emission IR spectra of chloroaluminate melts, improved technique for obtaining emission spectra of melts"
21	Dean E. Peterson, Los Alamos National Laboratory: "Thermodynamics of Actinide Intermetallics"
23	J. M. Leitnaker, Oak Ridge Gaseous Diffusion Plant: "Thermodynamics of uranium-fluorine compounds"

10 FEB 1978 (continued)

- | <u>Poster #</u> | <u>Presentation on TUESDAY, on display Monday and Tuesday</u>  |
|-----------------|--|
| 2               | E. Fitzer, J. Daimler and J. Schlichting, University of Karlsruhe, W-Germany<br>"Kinetics and mechanism of the formation of self healing oxide layers on complex high temperature Si/Cr/Si/Ta coatings and their attack under hot corrosion environments"  |
| 4               | M.A. Frisch, IBM Thomas J. Watson Research Center<br>"Vaporization studies of non-congruent systems using modulated beam mass spectrometry"  |
| 6               | F. J. Kohl and J. L. Smialek, NASA Lewis Research Center<br>"Al <sub>2</sub> O <sub>3</sub> scale degradation by an applied electric field"  |
| 8               | H. Tetenbaum, Argonne National Laboratory<br>"High temperature vaporization behavior of the solid breeder blanket Li-O-H system"   |
| 10              | A. H. Oner, Yale University<br>"Transient studies of gasification kinetics by plasma emission spectroscopy"  |
| 12              | S.A. Arthers, I.R. Beattie, T.R. Gilson, R.A. Gomme, S.N. Jenny, P.J. Jones, J.S. Ogden, J. Parkinson, and S. J. Williams, University of Southampton, England<br>"Vibrational spectroscopy in the characterisation of high temperature vapours and melts with particular reference to alkali metal salts of oxoanions" |
| 14              | C.W. Draper, Western Electric Co., Princeton<br>"laser surface melting and alloying: a new method for producing metastable crystalline and amorphous metal surfaces"   |
| 16              | V. B. Tare and J.B. Wagner, Jr., Arizona State University<br>"Electrical Conduction in Two Phase Nickel Oxide-Nickel Sulfide Mixtures"   |
| 18              | H.G. Adamson and R.W. Caputi, General Electric Co., Vallecitos Nuclear Center<br>"Melting temperature determinations and urania-fission product systems with up to 5 components"   |
| 20 (a)          | J. Janitsch, K.L. Komarek and J. Mikler, University of Vienna, Austria:<br>"Calorimetric measurements on liquid gold-indium alloys"  |
| (b)             | R. Krachler, P. Terzieff, H. Ipser and K.L. Komarek, University of Vienna, Austria<br>"Magnetic and thermodynamic properties of solid B'-AuMn"   |
| 22              | P.D. Kleinschmidt and J.W. Ward, Los Alamos National Laboratory:<br>"The role of f-electrons in actinide metal bonding"  |
| 24              | C.E. Meyers, State University of New York, Binghamton<br>"Thermodynamic stabilities of transition metal phosphides and -related compounds"   |

POSTER PRESENTATIONS (continued)

Poster      Presentation on FRIDAY, on display Wednesday and Thursday

- 1      H. Saltsburg and T. Miller, University of Rochester  
"Observations of surface structure during a heterogeneous catalytic reaction"
- 3      E. Halpern and I. Lutat (Yale University), D. Gross (Harvard University) and L. Doeven (University of Rochester)  
"Thermionic emission from incandescent Pt during the surface decomposition of hydrocarbons and the oxidation of adsorbed carbon"
- 5      E.J. Van Zee, C.A. Baumann, S.C. Bhat and V. Veltner, Jr., University of Florida  
"High temperature metal molecules"
- 7      K.E. Johnson, University of Regina, Canada  
"Electrochemical promotion and following of high temperature reactions"
- 9      P.A. Montano and J.M. Natarathna, West Virginia University  
"Electronic structure of bimetallic molecules of FeCr, FeSn and FePt"
- 11      J.W. Hastie, D.W. Bonnell and W.S. Borton, National Bureau of Standards  
"Activity and phase equilibria models of high temperature liquid-solid-glass-gas systems"
- 13      Z.K. Ismail, L. Fredin, R.H. Hauge, V.E. Billups and J.J. Margrave, Rice University  
"New Reactions of Metal Atoms"
- 15      D.J. Frurip and H. Blander, Argonne National Laboratory  
"Production of sub-micron metal alloy and ceramic powders via laser pyrolysis"
- 17      D.W. Bonnell and J.W. Hastie, National Bureau of Standards  
"Fragmentation temperature dependence in electron impact ionization of molecular beams"
- 19      M.W. Chase, Dow Chemical Company  
"JANAF thermochemical tables - reanalysis of the elements including sulfur and manganese"
- 21      P. Kofstad, University of Oslo, Norway  
"Defects and Diffusion in metal deficient oxides"
- 23      J.E. Kingcade, Jr. and K.A. Gingerich, Texas A&M University  
"Gaseous transition metal compounds with carbon, silicon, germanium, and tin"
- 24      O.J. Kleppa, University of Chicago  
"Thermochemistry of borides by high temperature solution calorimetry"

## GORDON RESEARCH CONFERENCES

ATTACHMENT C

## HIGH TEMPERATURE CHEMISTRY

Tilton School, Tilton, New Hampshire  
July 26-30, 1932K=Knowles  
P=Pfeiffer  
B=Beaumont  
M=MansionAlcock, Charles 120 wk  
Dept. of Metallurgy & Materials Science  
University of Toronto, CanadaArnold, James O. 343 wk  
NASA-Ames Research Center Moffett Field  
CA 94035Bamberger, Carlos 104 ek  
Oak Ridge National Laboratory, P.O. Box X  
Oak Ridge TN 37830Beahm, Edward C. 115 ek  
Oak Ridge National Laboratory, P.O. Box X  
Bldg 4501, Oak Ridge, TN 37830Beattie, Ian 344 wk  
The University, Southampton SO9 5NH  
Hampshire, England 0703Blackburn, Paul E. and Joy 25 p  
Argonne National Laboratory, 9700 S. Cass  
Argonne, IL 60439Blander, Milton off campus  
Argonne National Lab., 9700 S. Cass Ave.,  
Argonne, IL 60439Bonnell, David 344 wk  
National Bureau of Standards  
4329/223 Div. 561, Washington, DC 20234Botor, Jan P. 342 wk  
University of ToledoBowker, Jeffrey 103 ek  
Calgon Corp., P.O. Box 1346  
Pittsburgh, PA 15230Brennfleck, Karl 227 wk  
Kaiserstrasse 12 7500 KarlsruheBrewer, Leo 18 b  
Lawrence Berkeley Lab. University of Calif.  
Dept. of Chemistry Berkeley, CA 94720Brittain, Robert 337 wk  
SRI International, 333 Ravenswood Ave.,  
Menlo Park, CA 94025Carlson, K. Douglas 19 b  
Argonne National Lab., Chemistry Division  
9700 S. Cass Ave., Argonne, IL 60439Casleton, Kent H. 336 wk  
USDOE/Morgantown Energy Technology Center  
P.O. Box 830, Collins Ferry Road  
Morgantown, WV 26505Chase, Malcolm W. 7 b  
The Dow Chemical Co., 1707 Building  
Midland, MI 48640Crumley, Winfred 226 wk  
Georgia Institute of Technology, 225  
North Ave., Chemistry  
Atlanta GA 30332Cubicciotti, D. 6 b  
Electric Power Research Institute  
Box 10412, Palo Alto, CA 94303Culberson, Oran L. 5 b  
Engr. Coord. & Anal. Section, Oak Ridge  
National Lab., Oak Ridge, TN 37830Dagdigian, Paul J. 336 wk  
Johns Hopkins University, Dept. of Chemistry  
Baltimore, MD 21218Davies, Peter 246 wk  
Arizona State University  
Tempe, AZ 85281Dieckmann, R. and Christine 31p  
University of Hannover, Institute for  
Physical Chemistry, Hannover, W-GermanyDraper, Clifton 4 b  
Western Electric Engineering Research Ctr.  
P.O. Box 900, Princeton, NJ 08540Drowart, John 220 ek  
Vrije Universiteit Brussel, Pleinlaan 2  
B-1050 Brussels, BelgiumEdwards, Jimmie and Carol 21 p  
The University of Toledo, 2801 W. Bancroft  
Chemistry, Toledo, Ohio 43606Faizi, Edgar 341 wk  
University of California, Dept of Chemistry,  
Berkeley, CA 94720Fontijn, Arthur 245 wk  
Dept. of Chemistry, Rensselaer Polytechnic  
Inst. Troy, NY 12101

Lison, Margaret A. 8 m  
IBM Research, P.O. Box 210  
Yorktown Heights, NY 10541

Gilles, Paul W. 244 wk  
University of Kansas, Dept. of Chemistry  
Lawrence, KS 66045

Cole, James 226 wk  
Georgia Institute of Technology  
225 North Avenue, Chemistry  
Atlanta, GA 30332

Goodman, David 244 wk  
GTE Sylvania, 100 Endicott St.,  
Danvers, MA 01923

Goodman, D. Wayne 245 wk  
Sandia National Labs, Division 5114  
Albuquerque, NM 87185

Green, David 242 wk  
Argonne National Lab., 9700 S. Cass Ave.,  
Argonne, IL 60436

Gulbransen, Earl and Margery 22 p  
University of Pittsburgh, 848 Benedum Hall  
Pittsburgh, PA 15235

Guerra-Brady, Victoria and Roger 26 p  
University of Pennsylvania, 3231 Walnut St.,  
Philadelphia, PA 19104

Halpern, Bret 137 wk  
Yale University, Dept. Chemical Eng.  
Box 2159 Yale Station  
New Haven, CT 06520

Hamilton, John C. 24 wk  
Sandia National Laboratory, Division 8342  
Livermore, CA 94550

Hange, Robert 240 wk  
Rice University, P.O. Box 1892, Chemistry  
Houston, TX

Hastie, John W. 234 wk  
National Bureau Standards  
Washington, DC 20236

Hildenbrand, Donald 213 wk  
SRI International, Menlo Park, CA 94025

Hvistendahl, Jan 14 b  
University of Tennessee, Dept. of Chemistry  
Knoxville, TN 37910

Jacobson, Nathan 217 wk  
U. of Pennsylvania, 3231 Walnut,  
Philadelphia, PA 19104

Johnson, Ernest 233 wk  
Monsanto Research Corp., Mound Facility  
Miamisburg, OH 45342

Johnson, Keith 217 wk  
University of Regina, Chemistry Dept.  
Regina Sask S4S 0A2

Johnston, Graham off campus  
Naval Research Lab., Code 6395  
Washington, DC 20375

Kay, Jack 214 wk  
Drexel University, Dept. of Chemistry  
Philadelphia, PA 19104

Kessinger, Glen 342 wk  
University of Kansas, Dept. Chemistry  
Malott Hall, Lawrence, KS 66045

Kingcade, Joseph 214 wk  
Texas A&M University, Chemistry Dept.  
College Station, TX 77843

Kleinschmidt, Phillip 207 wk  
Los Alamos National Lab., Mail Stop  
G 730/CMB-5, Los Alamos, NM 37545

Kleppa, Ole 232 wk  
University of Chicago, James Franck Inst.  
5640 S. Ellis Ave., Chicago, IL 60637

Kohl, Fred 231 wk  
Nasa Lewis Research Center, 2100 Brookpark  
Cleveland, OH 44135

Kolb, Charles 230 wk  
Aerodyne Research, Inc., 45 Manning Road  
Billerica, MA 01821

Komarek, Kurt 229 wk  
University of Vienna, Inorganic Chemistry  
A-1090 Vienna, Austria

Kramer, Carolyn 3 m  
Naval Research Lab., Chemistry Division  
Code 6135, Washington, DC 20375

Lau, Kai-Hung 337 wk  
SRI International, 333 Ravenswood Ave.,  
Menlo Park, CA 94025

Leitnaker, James 342 wk  
Union Carbide Corp., Bldg K-1006, MS-271  
Oak Ridge, TN 37830

Levy, Donald H. 207 wk  
University of Chicago, 5640 S. Ellis Ave.,  
Chicago, IL 60637

Temperature Chemistry, 1964  
Levsky, Milton and Barbara 10 p  
Johns Hopkins Applied Physics Lab.  
Johns Hopkins Rd., Laurel, MD 20707

McNinn, T. D. 225 wk  
Monsanto, 800 North Lindbergh Blvd.  
St. Louis, MO 63166

Montano, Pedro and Liliana 19 p  
West Virginia University, Dept. of Physics  
Morgantown, WV 26506

Murad, Edmond 218 ek  
Air Force Geophys. Lab., Hanscom, AFB MA  
01731

Myers, Clifford and Marilyn 3 p  
State University of New York, Dept. Chemistry  
Binghamton, NY 13901

Nagelberg, Alan 204 ek  
Sandia National Labs, Division 8313  
Livermore, CA 94550

Navrotsky, A. 9 m  
Arizona State University, Dept. Chemistry  
Tempe, AZ 85287

Nordine, Paul 204 ek  
Yale University, P.O. Box 2159Y  
New Haven, CT 06520

Norman, John 10 b  
P.O. Box 81608, San Diego, CA 92138

Ohse, Roland 225 wk  
Commission of European Communities  
Postfach 2266, D-7500 Karlsruhe 1  
Federal Republic of Germany

Oner, Atilla 134 wk  
Yale University, Chemical Eng. Dept.  
New Haven, CT 06520

Oye, Harald 15 b  
Institute of Inorganic Chemistry NTH  
Sem Saelands vei 12, 7034 Trondheim Norway

Park, Chong 12 b  
Ohio State University, Metallurgical Dept.  
116 W. 19th Ave., Columbus, OH 43210

Plante, Ernest 132 wk  
National Bureau of Standards, A329 Mts  
Washington, DC 20234

Peterson, Dean 133 wk  
Los Alamos National Lab., MS730/CMB-5  
Los Alamos, NM 87545

United Kingdom Atomic Energy Authority  
UKAEA Harwell, Oxon England

Rapp, Robert off campus  
Ohio State University, 116 West 19th Ave.,  
Columbus, OH 43210

Rosenblatt, GERALD 202 ek  
Los Alamos National Laboratory  
Chemistry Div., Los Alamos, NM 87545

Russell, Timothy 132 wk  
General Electric Co., Lighting Business  
Group #1310, Mela Park, Cleveland, OH 44112

Saboungi, Marie-Louise off campus  
Argonne National Lab., 9700 S. Cass Ave.,  
Argonne, IL 60439

Sallach, Robert 341 wk  
Sandia National Labs., P.O. Box 5800  
Albuquerque, NM 87185

Saltsburg, Howard 338 wk  
University of Rochester, Dept. Chemical Eng.  
Rochester, NY 14627

Schaefer, Henry 11 b  
Dept of Chemistry, University of California  
Berkeley, CA 94720

Schiffman, Robert 128 wk  
Yale University, P.O. Box 2159 Yale Station  
New Haven, CT 06520

Schoonmaker, Richard and Dina 13 p  
Oberlin College, Dept. of Chemistry  
Oberlin, OH 44074

Shumaker, Craig 128 wk  
Standard Oil Co., 3092 Broadway Ave.,  
Cleveland, OH 44115

Simpson, Wade 1 p  
University of Kansas, Dept. of Chemistry  
Lawrence, KS 66044

Spear, Karl and Nancy 2 p  
Pennsylvania State University  
270 Materials Res. Lab., University Park,  
PA 16802

Speros, Dimitri and Nel 12 p  
General Electric, Lighting Research  
Mela Park, Cleveland, OH 44112

Tare, Vasudeo 127 wk  
Arizona State University, Ctr Solid State  
Science, Tempe, AZ 85287

High Temperature Chemistry -4-, 1982

Tetenbaum, Marvin and Zelda 11 p  
Argonne National Lab., 9700 S. Cass Ave.,  
Argonne, IL 60439

Thorn, Robert 203 ek  
Argonne National Lab., 9700 S. Cass Ave.,  
Argonne, IL 60439

Topor, Letitia 4 m  
University of Chicago, James Franck Inst.  
5640 S. Ellis Ave., Chicago, IL 60637

Uchida, Takaski off campus  
University of Pennsylvania, Material Sci.  
& Eng. 3231 Walnut St., Philadelphia, PA  
19104

Vala, Martin 127 wk  
University of Florida, Leigh Hall  
Chemistry, Gainesville, FL 32611

Van Zee, Richard and Margaret 9 p  
Chemistry Dept. University of Florida  
Box 565 Gainesville, FL 32611

Wagner, J. Bruce, Jr. 126 wk  
Arizona State University  
Center for Solid State Science  
Tempe, AZ 85018

Wahlheck, Phillip 116 ek  
Wichita State University, Chemistry  
Wichita, KS 67208

Weltner, William, Jr. 205 ek  
University of Florida, Chemistry  
Gainesville, FL 32611

White, Philip 116 ek  
GTE Products Corp., 100 Endicott St.,  
Danvers, MA 01923

Wiedemeier H. 339 wk  
Rensselaer Polytechnic Institute  
Chemistry, Troy, NY 12181

Worrell, Wayne 136 wk  
University of Pennsylvania  
3231 Walnut St., Material Science  
Philadelphia, PA 19104

Yoon, Seung Ryul off campus  
University of Pennsylvania, Dept. MSE  
3231 Walnut St., Philadelphia, PA 19104

Zubler, Edward 125 wk  
General Electric Co., Nela Park 1310  
Cleveland, OH 44112

Adamson, Martyn 343 wk  
General Electric Co., P.O. Box 460  
Pleasanton, CA 94566

Farrington, Gregory 3 b  
U. of Pennsylvania, 3231 Walnut St.,  
Philadelphia, PA 19086

Ismail, Zakya 3 m  
Rice University, P.O. Box 1892  
Houston, TX 77251

Olander, Donald 219 ek  
University of Berkeley, California  
Nuclear Engineering  
Berkeley, CA 94720

2. Every effort should be made to avoid scheduling the High Temperature Chemistry Conference on the same date as the conference on: Solid State Chemistry, Crystal growth, Solid State Studies in Ceramics, Molecular Electronic Spectroscopy, Plasma chemistry.
3. The poster sessions should be continued with the following changes:
  - a) Display the posters at a time and place more convenient to the participants. For example, display the posters in the dining or snack bar area and hold the sessions from 5:30 - 6:30 P.M.
  - b) Display only about 8 posters each day and do not leave the posters up for a second day.
  - c) Explore the possibility of allowing each poster presenter two minutes (one or two slides or transparencies) to present the title and a brief abstract of the poster at a time preceding each poster session.
4. Recommended topics for 1984, were presented and distributed to the conferees to assess their interest. (The list is attached to these minutes.

The Chairman express his thanks to Vice Chairman Karl Spear for his work in organizing and planning the poster sessions. Chairman-Elect Spear then expressed his thanks to Chairman Worrell for his efforts. He announced that the 1984 Gordon Research Conference on High Temperature Chemistry will be July 23-27, 1984, at Brewster Academy in Wolfeboro, N. H.

The meeting was adjourned at 12:25 P.M.

Respectfully submitted,

Clifford E. Myers,  
Secretary



Gordon Research Conference on

High Temperature Chemistry

Tilton School  
Tilton, New Hampshire

July 26-30, 1982

Minutes at the Business Meeting

The business meeting of the conference was called to order by the Chairman, Wayne Worrell, following the morning session on Thursday, July 29, 1982, at 11:45 A.M. He reported that there were 105 conferees (15 were from outside the U.S.) of which 20 were from industry, 30 from government, and 40 from universities. The last included 15 "young" scientists (graduate students and post-doctoral associates).

The Chairman expressed appreciation to the speakers and participants. He noted that the discussions had been vigorous and of high quality. He also expressed appreciation for the service of the projectionist.

Following the tradition of the conference, it was moved, seconded and carried that Karl Spear, the 1982 Vice Chairman, be elected Chairman of the 1984 Conference.

The Vice Nominating Committee which had been named on the first day of the conference, consisted of:

Gerd Rosenblatt, (Chairman), Leo Brewer, K. Douglas Carlson,  
Daniel Cubicciotti, Paul Gilles, John Hastie, and Robert Thorn.

The committee's nominees for the post of Vice-Chairman for the 1984 conference were announced:

Donald Hildenbrand, SRI International  
Bruce Wagner, Arizona State University

A secret ballot resulted in the election of D. Hildenbrand.

The Chairman called on Bruce Wagner for the report of the Recommendations Committee. Committee members were:

Bruce Wagner (Chairman from Arizona State University), Clifton Draper (Western Electric Co.), Margaret Frisch (IBM), James Cole (Georgia Inst. Technol.), David Green (Argonne Natl. Lab.), Fred Kohl (NASA - Lewis), Charles Kolb (Aerodyne Res. Inc.), Alexandra Novrotsky (Arizona State Univ.), and Dean Peterson (Los Alamos Natl. Lab.).

The Committee made the following recommendations:

1. There should be a Gordon Research Conference on High temperature Chemistry in 1984.

TOPICS FOR 1984 CONFERENCE

PLEASE INDICATE YOUR PRIORITY OF INTEREST FOR EACH TOPIC:

H (High), M (moderate), L (Low).

Return by noon Friday 7/30/82 or mail to Karl Spear.

1. Role of inorganic species in combustion
2. Negative ions of high temperature species
3. Analytical and diagnostic techniques: e.g. electrochemical sensors
4. Properties and measurements at temperatures above 3000K
5. Gas-solid reactions: experiments and theory
6. Resonance Raman spectroscopy
7. Microwave spectroscopy
8. Photoelectron spectroscopy
9. Supersonic beams
10. Hot stage microscopy
11. High pressure-high temperature systems
12. Alkali metal applications in fusion, fission, MHD
13. Intermetallics: formation in epi-layers
14. Liquid phase and molecular beam epitaxy
15. Vaporization: non-stoichiometry, incongruent vaporization, unusual gaseous species
16. Materials processing in low gravity
17. Clusters: formation, experiments, theory
18. Electron diffraction
19. Model studies on condensed phase equilibria
20. Molecular reaction dynamics: experiment and theory
21. Coal slags: spectroscopic and other studies
22. High temperature gaseous solutions
23. Overview of chemical transport
24. Rare earth solids and vapors
25. Model calculations on condensed phase dynamics
26. High temperature disposal of organic waste
27. Evaluation and compilation of thermophysical data
28. Geological and astro physical processes
29. New and innovative methods for metals production
30. Cohesive energies of high temperature solids

ATTACHMENT E

Budget Breakdown for OR Contribution

1982 GRC on High Temperature Chemistry

A. Conference Fixed Fee (\$230) Support for 10 Participants

1. P. J. Dagdigan, The Johns Hopkins University
2. J. Edwards, University of Toledo
3. G. C. Farrington, University of Pennsylvania
4. R. Hauge, Rice University
5. D. Levy, University of Chicago
6. A. Navrotsky, Arizona State University
7. P. C. Nordine, Yale University
8. K. E. Spear, Pennsylvania State University
9. M. Vala, University of Florida
10. H. Wiedemeir, Rensselaer Polytechnic Institute

\$2,300

B. Domestic Travel Support

- |  |               |
|--|---------------|
| 1. L. Brewer, University of California | \$ 230        |
| 2. P. Gillis, University of Kansas     | 230           |
| 3. D. Levy, University of Chicago      | 250           |
|  | <u>\$ 700</u> |

Total \$3,000